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**Magnetism**

**Main Idea**

Magnetic fields are created from a moving or spinning charge. The magnetic domain is clusters of aligned atoms; an object becomes magnetized when the magnetic domains become aligned.

* Magnets always wave two poles, north and south.
* If you break a magnet in half each broken piece then becomes its own magnet with two poles.
* The north pole of a compass always points to our magnetic north.

Wires that carry a charge directly experience a force when they enter a magnetic field because they are creating their own magnetic field. So the formula for this effect is…

**F = ILB**

F = Force (N)

L = Length of the wire (m)

I = Current (A)

B = Magnetic Field (T)

**Ex: Problem #1**

There is a current of 6.0A traveling through a 2.5m long wire that is perpendicular to an .80T magnetic field. How strong is the force acting on the wire? **F = 12N**

I = 6.0A Find Equation

B = .80T F F = ILB

L = 2.5m

The force on a moving charge can be calculated with the following equation…

**F = qvB**

F = Force (N)

Q = Charge (C)

V = Velocity (m/s)

B = Magnetic Field (T)

**Ex: Problem #2**

The University of Illinois is playing Ohio State University at home where the magnetic field is 7.0 x 10-5T. Juice Williams, the Illinois quarter back throws a pass with a charge of 1.0 x 10-13C as it leaves his hand at 30m/s. What is the force on the ball before Arrellious Benn catches the touchdown pass? **F = 2.1 x 10-16N**

Q = 1.0 x 10-13C Find Equation

V = 30 m/s F F = qvB

B = 7.0 x 10-5T

**Additional Resources:**

<http://www-istp.gsfc.nasa.gov/Education/Imagnet.html>

<http://www.ndt-ed.org/EducationResources/HighSchool/Magnetism/hs_mag_index.htm>

<http://www.factmonster.com/ce6/sci/A0831162.html>